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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/815,604

03/31/2004

Andrew Ho

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EXAMINER

PERILLA, JASON M

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/815,604	<b>Applicant(s)</b> HO ET AL.	
	<b>Examiner</b> JASON M. PERILLA	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-14, 16-25, 27-36, 38-43, 45 and 46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 34-36, 38, 39, 41-43 and 46 is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-14, 16-25 and 27-33 is/are rejected.
- 7) ☒ Claim(s) 40 and 45 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Claims 1-8, 10-14, 16-25, 27-36, 38-43, 45, and 46 are pending in the instant application.

#### ***Response to Amendment/Argument***

2. The Applicant's claim amendments and remarks filed March 20, 2008 have been considered by the Examiner.

Regarding the drawings, in view of the Applicant's remarks, the objections to the drawings have been withdrawn.

Regarding the Applicant's argument over the combination of Matsumoto et al (U.S. Pub. No. 2002/0131531; "Matsumoto") in view of Lee et al (U.S. Pub. No. 2002/0085656), the Examiner does not agree that one skilled in the art would be unable to produce a combination of the references having utility as suggested. However, in light of a newly discovered reference, the rejections have been withdrawn and replaced.

New rejections are set forth below.

#### ***Claim Objections***

3. Claims 40 and 45 are objected to because of the following informalities:

Regarding claim 40, the data filter is claimed as being coupled to "the comparison circuit output node" although no node exists.

Regarding claim 45, the claim is objected to for the same reasons as applied to claim 40 above.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

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4. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 31 and 33 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claim 31, the claim is rejected because the specification does not enable the “comparing” of “only a subset of the first and second series of sampled-data symbols” as claimed. Rather, the comparing circuit (fig. 7, ref. 755) is, by connections within the circuit (in each of figures 7 and 13), necessarily required to compare each and every sample of the output of the first sampler (705) with the output from the second sampler (710). Therefore, one skilled in the art is not enabled by the specification to compare only a “subset” of the series of data output from the first and second samplers as claimed.

Regarding claim 33, the specification does not enable “comparing” of the first and second series of samples *only* “when the matching produces a match”. Rather, in figure 13, comparing (1015) occurs for every series of sampled data regardless of whether a match (1315) occurs. Therefore, the claimed “selective” comparing is not enabled.

6. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-8, 10 and 11 are rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

Regarding claim 1, the claim is rejected because the structural interconnection between the multiplexer and comparison circuits is not clearly claimed, and it makes the claim indefinite because various interpretations outside the scope of the invention as disclosed in the specification are possible. Specifically, according to figure 7, the "comparison circuit" (755) is coupled to the "multiplexer" (715 and 720). However, such features are not appropriately captured by the claim to make them definite.

Claims 2-8, 10 and 11 are rejected as being based upon a rejected parent claim.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 12, 13-24, and 27-31 are rejected under 35 U.S.C. § 102(b) as being anticipated by Ono et al (U.S. Pat. No. 5896392; "Ono").

Regarding claim 12, Ono discloses, according to figure 1, a method comprising:  
a. sampling a series of input symbols ("DATA IN") using a first clock signal ("CLOCK IN") of a first clock phase (3) to produce a first series of sampled symbols (Q\ output of 5); b. sampling the series of input symbols using the first clock signal ("CLK") of a

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second clock phase (4) to produce a second series of sampled symbols (Q\ output of 6); and c. comparing (7) sampled symbols of the first series of sampled symbols with corresponding sampled symbols of the second series of sampled symbols; wherein the series of input symbols are sampled using the first clock phase (3) at a first sample voltage ("Vm") and using the second clock phase (4) at a second sample voltage ("Vs").

Regarding claim 13, Ono discloses the limitations of claim 12 as applied above. Further, Ono discloses adjusting (11), in response to the comparing (output of 7), at least one of the first and second clock phases (adjust 3 via 12 or adjust 4 via 13) with respect to the other of the first and second clock phases.

Regarding claim 16, Ono discloses the limitations of claim 12 as applied above. Further, Ono discloses adjusting (11) at least one of the first ("Vm") and second ("Vs") sample voltages with respect to the other of the first and second sample voltages in response to the comparing (output of 7).

Regarding claim 17, Ono discloses the limitations of claim 12 as applied above. Further, Ono discloses issuing an error signal (output of 7) in response to a mismatch between ones of the first and second series of sampled symbols.

Regarding claim 18, Ono discloses the limitations of claim 12 as applied above. Further, One discloses that comparing produces error data for a plurality of phase offsets between the first and second clock phases (see discussion below), the method further comprising storing the error data (10). Ono's comparing (7) produces error data for every instance of sample output from samplers

Regarding claim 19, Ono discloses the limitations of claim 18 as applied above. Further, Ono discloses storing information regarding each of the phase offsets (figs. 1 and 3; " $\phi$  S") and the corresponding error data (output of 7 represented as "BIT ERROR RATE" in figs. 3A and 3B; cols. 7-9). Because Ono's controller (fig. 1, ref. 11) utilizes the data points shown in figs. 3A and 3B, the errors and corresponding phases are inherently stored in memory.

Regarding claim 20, Ono discloses the limitations of claim 18 as applied above. Further, Ono discloses, as broadly as claimed, calculating a timing margin (fig. 1, " $\Phi_m$ " and " $\Phi_s$ ") using the error data.

Regarding claim 21, Ono discloses the limitations of claim 18 as applied above. Further, Ono discloses the remaining limitations of the claim as applied to claim 12 above.

Regarding claim 22, Ono discloses the limitations of claim 21 as applied above. Further, Ono discloses, as broadly as claimed, plotting the first-mentioned error data and the second error data (figs. 3A and 3B).

Regarding claim 23, Ono discloses the limitations the claim as applied to claim 12 above.

Regarding claim 24, Ono discloses the limitations of claim 23 as applied above. Further, Ono discloses the remaining limitations of the claim with respect to claim 16 above.

Regarding claim 27, Ono discloses the limitations of claim 23 as applied above. Further, Ono discloses the remaining limitations of the claim with respect to claim 13 above.

Regarding claim 28, Ono discloses the limitations of claim 27 as applied above. Further, Ono discloses the remaining limitations of the claim with respect to claim 19 above.

Regarding claim 29, Ono discloses the limitations of claim 28 as applied above. Further, Ono discloses the remaining limitations of the claim with respect to claim 20 above.

Regarding claim 30, Ono discloses the limitations of claim 29 as applied above. Further, Ono discloses the remaining limitations of the claim with respect to claim 21 above.

Regarding claim 31, Ono discloses the limitations of the claim as applied to claim 12 above. Further, at least for the same reasons as applied in the instant application, Ono's comparator (fig. 1, ref. 7) for comparing compares only a subset of the first and second series of sampled-data symbols.

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.



11. Claims 14, 25, 35, and 36 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ono in view of Best et al (U.S. Pub. No. 2002/0196883; “Best” – previously cited).

Regarding claim 14, Ono discloses the limitations of claim 12 as applied above. Ono not explicitly disclose that the data input terminal, the first sampler, the second sampler, and the comparison circuit are disposed on a semiconductor chip. However, placing several circuit components on a single semiconductor substrate is notoriously known in the art as evidenced by Best (¶ 0047). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the various circuit components of Ono could be disposed on a single semiconductor chip or integrated circuit as disclosed by Best.

Regarding claim 25, Ono discloses the limitations of claim 23 as applied above. Further, Best discloses the remaining limitations of the claim as applied in claim 2 above.

12. Claim 32 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Ono in view of Komatsu et al (U.S. Pat. No. 6631486; “Komatsu” - 2/4/08 IDS ref 10).

Regarding claim 32, Ono discloses the limitations of the claim as applied to claim 12 above. Ono does not explicitly disclose matching the first series (fig. 1, ref. 8; “DATA OUT”) of sampled data symbols to at least one data pattern. However, many reasons for comparing sampled data to a data pattern are expanded upon in the art as suggested by Komatsu. Komatsu discloses, in analogous art, comparing (fig. 1, ref. 10) received data (fig. 1, “Data\_Rx”) to expected data (fig. 1, “EXPECTED VALUE”) to test

the correct receipt data. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to apply a data comparison to Ono's received first series as suggested by Komatsu because it could be utilized to determine if Ono's receiver correctly interpreted the received data.

***Allowable Subject Matter***

13. Claims 34-36, 38-43, 45 and 46 are indicated to contain allowable subject matter.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON M. PERILLA whose telephone number is (571)272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Jason M Perilla/  
Primary Examiner, Art Unit 2611  
May 12, 2008

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